

directed generally to a significant common feature. Thus sub-division I. refers to the rejection of claims 15, 6, 7, 16 and 17 in paragraphs 3. and 6., sub-division II. refers to the rejection of claims 4 and 19 in paragraphs 4 and 7, and sub-division, III. refers to the rejection of claims 8 and 9 in paragraph 5.

**I. Claims 15, 6, 7, 16 and 17**

The invention claimed in claims 15, 6, 7, 16 and 17 on the one hand and claims 1-10 of the 885' patent on the other hand are patentably distinct because:

- A. The physical objects which are the subject of treatment are different;
- B. The starting condition of the physical objects to be treated is different;
- C. The extent of physical involvement of the objects being treated is different;
- D. The treatments applied to the two physical objects are different (due to the differences between the two treating apparatuses);
- E. The environments in which the two treatments are carried out are different;  
and
- F. The final products resulting from the two dissimilar treatment processes are different.

**A. The physical objects which are the subject of treatment are different.**

We refer to claim 15 of this application, see attachment, and claim 1 of patent 6,398,885, hereafter the '885 patent, see attachment, initially as illustrative of this group of claims.

Claim 15 is directed to "heat treatment" of rod, bar and block tool steel. The phrase

"heat treatment" in claim 15 is defined in the specification of the application as conventional heat treatment; that is heating a rod, bar or block all the way through for some purpose -- usually (as we believe the Examiner will agree) to harden or stress relieve the entire workpiece, i.e.: the center as well as the outer portions. See for example page 1, lines 13-19 in which removal of the decarburized layer which is present on all surfaces following heat treatment -- is disclosed. Also, see page 3, lines 14-15:

"With respect to equipment it is believed that existing heat treatment furnaces can be used with little or no modification, or preferably, with selective modification."

We presume the Examiner will concur that it is well known to those skilled in the art that "existing heat treatment furnaces" means large, closed containers in which the heat, by whatever means generated (usually gas jets), completely envelopes the workpiece undergoing treatment. And see also page 4, lines 5-7:

"By the same token, if a block having a 10" by 10" cross-section is to be heat treated a substantially longer processing time will be required due to the time lag of the temperature rise in the center of the workpiece." (emphasis added)

By contrast, claim 1 of the '885 patent refers only to the "shank portion of a pre-hardened die block".

In other words, claim 15 refers to treatment of the entirety of rods, and bars, and blocks whereas claim 1 of the '885 patent deals with a portion (i.e.: two inches is specifically

claimed) of a die block. Rods, bars and blocks are not the same thing as, and do not equal, the "shank portion of a die block", and a "block" standing alone does not equal the "shank portion" of a die block. We call the Examiner's attention to the fact that there are a myriad of blocks known in the steel industry: sow blocks, hammer blocks, bull blocks, motor blocks, double-deck blocks, wheel blocks, drawing blocks to name a few, and "a shank portion of a ... die block" cannot possibly be equated with any one of the above listed blocks.

Hence the physical object which is the subject of treatment in application claim 15 and also claims 6, 7, 16 and 17 on the one hand and claim 1 of the '885 patent on the other hand are different, and since the physical object of the broadest claim in the application product is different from the physical object of the broadest claim in the '885 patent, it follows that all other claims of this group, i.e.: 6, 7, 16, and 17 are different from claim 1 of the '885 patent -- and all other claims (2-10) of the '885 patent.

**B. The starting condition of the physical objects to be treated are different.**

We again refer to claim 15 of this application and claim 1 of the '885 patent.

Claim 15 is directed to "a rod or bar or block" without further specification as to its condition. Claim 1 of the '885 patent by contrast is directed to a "pre-hardened die block having a working side and a mounting side".

A piece of steel which has been "pre-hardened" means, to a man skilled in the art, that the piece, after melting and cooling, has been subjected to heat to bring the piece to a desired or maximum level of hardness all the way through. In other words, the piece of steel in claim 1 of the '885 patent starts treatment in its final, hardest condition. By contrast, the

steel in claim 15 of the application starts in an unspecified condition; it may be soft, it may be hard, it may be at some intermediate processing stage. The Examiner will note that, to a man skilled in the art, the words "heat treating" are assumed to mean, unless specifically contradicted, that the steel is in quenched condition, possibly at room temperature (or possibly a little above room temperature such as 300°F) and that heat is being applied to it for the dual purpose of relieving internal quenching stresses and of achieving a desired hardness level.

Thus claims 15, 6, 7, 16 and 17 refer to steel in any condition whereas claim 1 of the '885 patent specifically requires that the steel be in a hardened condition.

Since claims 2-10 of the '885 patent add further limitations to claim 1 therein, it follows that said claims 2-10 are even more remote from the claimed process application of claims 15, 6, 7, 16 and 17.

**C. The extent of physical involvement of the objects being treated are different.**

We again refer to claim 15 of this application and claim 1 of the '885 patent.

Claim 15 of this application requires the providing of "a heat treatment furnace of a size suitable to receive a tool steel workpiece to be heat treated". In other words the whole workpiece is subjected to treatment. By contrast in claim 1 of the '885 patent, only the "mounting side" of the workpiece "having a depth of about 2 inches extending in a direction toward said working surface" is subjected to treatment. In other words all of the workpiece in application claims 15, 6, 7, 16 and 17 are subjected to treatment whereas only a small,

specific portion, less than all, of the workpiece is subjected to treatment in claim 1 of the '885 patent. There is no teaching or suggestion in claim 1 of the '885 patent that all of the workpiece could or should be subjected to treatment. Indeed, to subject all of the workpiece in claim 1 would totally defeat the purpose of the '885 patent because to do so would result in a 100% softened final product whereas the aim of the '885 patent is to produce a product having a hard portion and a soft portion, both portions being intended to perform a separate and distinct function. Thus, patent claim 1 contains a teaching directly contrary to the through hardening of application claim 15.

**D. The Treatments applied to the two physical objects are different.**

Claim 1 of the '885 patent requires that all but the treated portion of the workpiece be subjected "to ambient conditions, including ambient atmosphere". By contrast, the tool steel workpieces of claims 15, 6, 7, 16 and 17 are treated in a conventional furnace and, even if the conventional furnace is leaky, it cannot be said by any stretch of the imagination that the physical objects of claims 15, 7, 16 and 17 are treated in the presences of "ambient atmosphere". In essence there is no disclosure or suggestion within the four corners of claim 1 (or any other claim) of the '885 patent that all of the workpiece in claims 15, 6, 7, 16 and 17 should be only treated in a partial area thereof; indeed the whole rationale for claim 1 of the '885 patent is to finish with a differential hardness in a workpiece; application claims 15, 6, 7, 16 and 17 contain no such limitation.

**E. The environments in which the two treatments are carried out are different.**

In the method of claim 1 of the '885 patent the workpieces undergoing treatment are subjected to two different treatment environments: firstly, a two inch deep first portion (lines 1-4, col. 10) is subjected to a very high treatment temperature which initially entails a very hot, non-ambient atmosphere adjacent that two inch deep portion and, secondly, a second portion which is not exposed to the heat applied to the first portion, is subjected to "ambient conditions, including ambient atmosphere". By contrast, the workpieces in claim 15, 6, 7, 16 and 17 in the application are subjected to a single treatment environment. By contrast, the atmosphere found in a "heat treat furnace" is, as any man skilled in the art appreciates, a single treatment environment; hot or not too hot, but in no sense atmospheric.

In sum, there is no teaching or suggestion in the '885 claims that the two treatment environment system of the '885 claims should be modified to be a single treatment environment system of a heat treat furnace as required by claims 15, 6, 7, 16 and 17.

**F. The final products resulting from the two dissimilar treatment processes are different.**

Claim 1 of the '885 patent is directed to treating only a portion, specifically the shank portion, which is opposite the hardened working surface, of a workpiece, so as to finish with a single object having two zones of hardness; one, the initial unchanged hardened condition and the other, the final softened condition of the two inch deep section as clearly specified in lines 17-20, col. 10 of claim 1 which speaks in terms of "said opposite portion is softened, as contrasted to the fully hardened working surface". By contrast the concept of differential hardness within the workpiece is nowhere even hinted at in the claims 15, 6,

7, 16 and 17.

We call the Examiner's attention to the fact that a soft portion, for assuming shock loads, and a hard portion, for shaping rough workpieces, is the essential concept in claim 1 of the '885 patent, and nowhere within the four corners of claims 1-10 in the '885 patent is there a disclosure or suggestion that the entire final workpiece should have a uniform hardness.

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It is clear that claims 15, 6, 7, 16 and 17 are patentable over any one of claims 1-10 of the '885 patent.

## **II. Claims 4 and 19**

The inventions claimed in claims 4 and 19 on the one hand and claims 1-10 of the '885 patent on the other hand are patentably distinct because:

A. The objects which are the subjects of treatment are different because, in sum, claims 1-10 of the '885 patent are directed to treating a specified portion of a workpiece (specifically two inches depth on the surface opposite the working surface) whereas application claims 4 and 19 are directed to treating the entire workpiece. In order to expedite consideration we here merely incorporate by references I.A. above.

B. The starting conditions of the workpiece to be treated are different because, in sum, claim 1-10 of the '885 patent are directed to a workpiece which has been "pre-hardened" whereas, by contrast, in application claims 4 and 19 the workpiece starts the process in a non-final condition. In order to expedite consideration we here merely

incorporate by reference I.B. above.

C. The degree of physical involvement of the workpieces being treated is different because, in sum, claims 1-10 of the '885 patent are directed only to treatment of two inches on one side of a workpiece whereas, by contrast, in application claims 4 and 19 the entire workpiece is subjected to treatment. In order to expedite consideration we here merely incorporate by reference I.C. above.

D. The treatment applied to the two physical objects are different because claims 1-10 of the '885 patent require that all but the treated portion of the workpiece be subjected "to ambient conditions, including ambient atmosphere" whereas, by contrast, the workpiece of application claims 4 and 19 is treated in a conventional furnace, and hence can in no sense be subjected to ambient atmosphere. In order to expedite prosecution we here merely incorporate by reference I.D. above.

E. The environments in which the two treatments are carried out are different because in claims 1-10 of the '885 patent the workpiece is subjected to a very high temperature over a two inch deep portion with the remainder being subjected to ambient conditions whereas, by contrast, in claims 4 and 19 no such starting condition can be reasonably inferred. In order to expedite prosecution we here merely incorporate by reference I.E. above.

F. The final product resulting from the two dissimilar treatment processes are different because claims 1-10 of the '885 patent treats only the shank portion of a workpiece so as to finish with a final product having two zones of hardness whereas, by contrast with application claims 4 and 19, the end result of different zones of hardness in the same unitary



physical object is nowhere taught or suggested. In order to expedite prosecution we here merely incorporate by reference I.F. above.

G. Claims 1-10 of the '885 patent make no reference to the use of any reflective surfaces because after treatment of the two inch deep shank portion of the workpiece so as to provide "an easily machineable condition" as required by the patent, the "initial hardened condition is unchanged" (lines 22-25, col. 10). By contrast, the purpose of using reflective surfaces as set out in the application claims is to attempt to uniformly apply the generated heat around the entire workpiece, and, since claims 1-10 of '885 require that the "initial hardened condition (be) unchanged" it follows that applying sufficient heat to soften the remainder of the workpiece (i.e.: outside of the two inch thick layer of interest) is not a desirable result. The '885 patent contains no teaching or even a remote suggestion that it would be desirable to add such heat reflective capability to the claimed process.

### **III. Claims 8 and 9**

The inventions claimed in claims 8 and 9 on the one hand and claims 1-10 of the '885 patent on the other hand are patentably distinct because

A. The objects which are the subjects of treatment are different because, in sum, claims 1-10 of the '885 patent are directed to treating a specified portion of a workpiece (specifically two inches depth on the surface opposite the working surface) whereas application claims 8 and 9 are directed to treating the entire workpiece. In order to expedite

consideration we feel merely incorporate by references I.A. above.

B. The starting conditions of the workpiece to be treated are different because, in sum, claim 1-10 of the '885 patent are directed to a workpiece which has been "pre-hardened", whereas, by contrast, in application claims 8 and 9 the workpiece starts the process in a non-final condition. In order to expedite consideration we here merely incorporate by reference I.B. above.

C. The degree of physical involvement of the workpiece being treated is different because, in sum, claims 1-10 of the '885 patent are directed only to treatment of two inches on one side of a workpiece whereas, by contrast, in application claims 8 and 9 the entire workpiece is subjected to treatment. In order to expedite consideration we here merely incorporate by reference I.C. above.

D. The treatment applied to the two physical objects are different because claims 1-10 of the '885 patent require that all but the treated portion of the workpiece be subjected "to ambient conditions, including ambient atmosphere" whereas, by contrast, the workpiece of application claims 8 and 9 are treated in a conventional furnace, and hence can in no sense be subjected to ambient atmosphere. In order to expedite prosecution we here merely incorporate by reference I.D. above.

E. The environments in which the two treatments are carried out are different because in claims 1-10 of the '885 patent the workpiece is subjected to a very high temperature over a two inch deep portion with the remainder being subjected to ambient conditions whereas, by contrast, in claims 8 and 9 no such starting condition can be reasonably inferred. In order

to expedite prosecution we here merely incorporate by reference I.E. above.

F. F. The final product resulting from the two dissimilar treatment processes are different because claims 1-10 of the '885 patent treats only the shank portion of a workpiece so as to finish with a final product having two zones of hardness whereas, by contrast with respect to application claims 8 and 9, the end result of different zones of hardness in the same unitary physical object is nowhere taught or suggested. In order to expedite prosecution we here merely incorporate by reference I.F. above.

G. Claims 1-10 of the '885 patent teach against the use of a "non-air environment" or "a vacuum environment" of application claims 8 and 9, and hence there is no disclosure or suggestion to add to claims 1-10 anything discussed in Heath. Specifically:

Claim 1 of the '885 patent claims a die block having a working side and a mounting side. Thus a conventional die block is the subject of the claim, and such a die block, in square cornered block form (which describes the vast majority of die blocks), consists of a flat top (the mounting portion), a flat bottom (the working portion) and vertical sides between the top and bottom. Claim 1 describes softening the top two inches of the die block so that a typical dove-tailed key can be formed in it, the dove-tailed key being able to be received in a dove-tailed keyway in a forging hammer. Those skilled in the art appreciate that there is no reason to put the surface of the top portion in any particular condition following softening of the mounting portion because a machine tool known as a hogger is going to form the above mentioned dove-tailed key in the mounting portion, and any scale that may be present on the surface of the mounting portion after the softening process of claim 11 is

carried out is of no importance -- particularly in view of the deep cuts made by a hogger.

The vertical sides never form a working surface and hence whether they contain scale or pitting is irrelevant.

The bottom or working surface, even when supplied to a customer in a machined condition, is always subjected to extensive machining operations to form even a simple cavity in the die block. The end customer user of the die block always machines a smooth to very smooth surface on the working face to serve as a reference plane preparatory to making a cavity in the die block. Hence the finish machinist does not care whether the surface supplied to him by the steel mill is machined or slightly pitted or corroded or scaled; he is going to remove a thin layer so as to form his own reference surface. The speed with which the reference plane is formed is not a significant factor in view of the many hours which will be spent by the machinist on the die block before he turns a finished die over to the production department.

In sum, in view of (a) the many, many man hours which the end-user customer is going to apply to the die block with a softened mounting portion before the newly created production tool is turned over to the production department for mounting in a forging hammer, and (b) the extreme competitiveness of the die block industry, there is no incentive to incur the added expense of creating a non-air atmosphere or a vacuum environment in the process of "conditioning a shank portion of a prehardened die block" (lines 37, 38, col.9). In fact, there is an incentive to avoid expending time and money on the no-value-added feature of smooth surfaces on the die block.